

*SCHIZOGLOSSA*; A NEW GENUS OF CARNIVOROUS  
SNAILS.

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(Plates IX.-X.)

After describing his ascent of Kakepuku, a hill in the Middle Waikato Basin, 1531 feet high, situated near the junction of the Waipa and Mangawero Rivers, Hochstetter says (New Zealand, English Edition, 1867, p. 317): "The top is said to have formerly been fortified and cultivated; only on the south-west side there is a small tract of forest remaining, which the chief, who is the owner of that ground, had ordered to be spared. This sylvan grove welcomed us to its cooling shade, and was moreover found to be rich in small, but also rare landshells. Besides numerous small species of *Helix*, *Realia turriculata*, Pfr., and *Daudebardia novoseelandica*, Pfr., are found here frequently."

From specimens there collected Pfeiffer described [Malak. Blatt., Vol. viii., 1861 (1862), p. 146] *Daudebardia novoseelandica*,\* remarking that he had no information of this animal, the shell of which was larger than that of any known *Daudebardia*. Translations (Manual of the New Zealand Mollusca, 1880, p. 12, &c.) and reprints (Mon. Hel. Viv. v. p. 10, &c.) of Pfeiffer's original diagnosis constitute the remainder of the literature relating to this species. No animals seem to have reached the hands of any naturalist, and no figures of the shell have been published. Prof. Hutton described (Trans. N.Z. Inst. Vol. xiv. p. 152) the exterior and the dentition of a snail deprived of its shell, under the illusion that he was dealing with *D.*

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\* Dr. von Martens has proposed (Critical List N.Z. Moll. p. v.) to reduce all specific names meaning of or from New Zealand to the common form of *neozelanicus*, but, except to correct an evident misprint or obvious error in spelling, it is undesirable to swerve from fixity of nomenclature.

*novoseelandica*, the shell but not the animal of which he knew. Complete specimens from the same source proved later (Op. cit. Vol. xv., p. 140) to be a species of *Testacella*.

Mr. Brazier, having recently received from Mr. R. Murdoch, of Wanganui, N.Z., specimens of this mollusc collected by that gentleman near Stratford, a township inland from Mt. Egmont, has, most liberally, placed these treasures at my disposal for dissection and description. These animals had, I understand, been carefully drowned in water before being placed in alcohol, and probably present a tolerable resemblance to the living snails. Their external appearance is quite suggestive of the European carnivores *Daudebardia* and *Testacella*; the rudimentary shell quaintly perched on the creature's tail, the auriform shape of that shell and the aculeate teeth of the radula all combine to present a strong, but I am persuaded a superficial and misleading, likeness to their antipodean representatives. Closer examination detects differences in every detail. Comparing the pulmonary orifices: that of *Schizoglossa* is seen, as depicted in my sketch, located in the usual antero-lateral margin of the mantle. To contrast with this, I have copied on my plate fig. 9, pl. v. of Moquin-Tandon's "Histoire Naturelle des Mollusques terrestres et fluviatiles de France," showing the totally different and remarkable position of the same orifice (*f*) in *Testacella*. I am unacquainted with any illustration of the foramen of *Daudebardia*, but suppose it to be similarly placed, because Fischer says of it (Journ. de Conch. v. 1856, p. 16), "Behind there opens obliquely the respiratory pouch, which is rather large and extends opposite the point of the foot." The grooves that run outwards and downwards from the shell along the body in the European genera are wanting in *Schizoglossa*. The shells of the three genera under discussion are quite dissimilar, the New Zealand shell standing alone as to its remarkable little pit, excavated for the reception of the shell-muscle; a feature more resembling the ligament-pit of some bivalves than an ordinary columella muscle-scar.

Contracted in alcohol, *S. novoseelandica* is in length 20 mm., in height and breadth 9 mm. Behind the shell, situated upon

the hinder half of the body, the tail slightly projects ; it is flat, without a trace of a mucous gland, and bluntly pointed. The margin of the foot is produced into a slight flange. A pair of grooves running along the median line from the mantle to the muzzle define a row of small tubercles. Right and left, between this median line and the foot edge, there may be traced two indistinct grooves proceeding from the mantle to the lips. Posterior to these the surface is divided into tubercles by small irregular grooves meandering outwards and downwards. Mantle margin simple, unlobed, protruding around the circumference of the shell. Sole without a defined median area. Colour reddish-brown, splashed with black, darkest above ; mantle and sole ashy-yellow. The animal in motion probably resembles *Paryphanta busbyi* as portrayed P.L.S.N.S.W. (2), ii. pl. xx. fig. 6.

Shell rudimentary, auriform, thin, opaque, oval, increasing irregularly. Colour, without, glossy chestnut shaded to greenish-yellow at the margin, spire tinged with pink ; within, nacreous, gleaming white and purple, columella white. Whorls 2 ; first  $1\frac{1}{2}$  embryonic, succeeding half adult, embryonic shell  $\frac{1}{7}$  of total length, regular, well defined, commencing smooth, afterwards spirally grooved ; adult most rapidly increasing, finger-nail shaped, descending much at the suture, coarsely irregularly transversely wrinkled and faintly spirally grooved. Growth margin sharp yet firm, exhibiting no trace of an epidermal fringe. Columella stout, below terminating in a minute double tubercle, above broadening upon the embryonic whorl and excavated for the reception of the columella muscle. Length, 10 ; breadth, 7 ; height, 2 mm.

Jaw none.

Radula strap-shaped, 12 mm. long by 3 broad. Formula, 61 rows of 24 : 0 : 24. The central tooth is wanting, and probably many others are missing with it. Here and there in the rachidian cleft (which suggested the generic name) appears a minute, rudimentary and unsymmetrical denticle. From this the four innermost teeth, of a starved and functionless appearance, increase rapidly in size ; the remaining teeth are in bulk nearly equal. The crest of the radula being crushed down by the cover glass, the

teeth of my illustration are seen, those to the right pressed down on their right side and those to the left on their left. Viewed perpendicularly, the teeth appear straighter and narrower, presenting much resemblance to those figured and described for *Rhytida lampra*. The pharynx is enormous, occupying almost the whole length of the visceral cavity and nearly equalling in size the remainder of the viscera. The small stomach overlies it and leads to a short intestine which after passing close to the heart reaches the anus at the mantle margin. From the posterior end of the pharynx a muscle proceeds to the shell-muscle. A long contorted foot-gland runs the length of the floor of the visceral cavity, originating beneath the mouth and terminating in a knob within the tail.

The genital apparatus is of the simplest description. The penisac is more reduced than in any mollusc with which I am acquainted, appearing to be represented by a slight bulbous swelling near the orifice, a vas deferens arising therefrom, and a short muscle attaches this swelling to the nearest point of the body wall. I found no spermatheca. A complete egg in the oviduct of one specimen dissected proved the maturity of the animal, and the agreement of three specimens examined attested the uniformity of this remarkable system. Mr. Murdoch found the eggs to be laid in the month of August; he states that "The eggs were found principally under a good thickness of decaying fern leaves, and were in little heaps of from six to as many as fourteen." These eggs are white, hard-shelled, oval, 4 mm. major axis, 3 mm. minor axis, coarsely granular without, smooth within. The embryo in one I opened was in an early stage of development and had not yet acquired any recognisable molluscan features.

*Summary.*—On the evidence of the naked shell, (*D.*) *novoseelandica*, Pfr., was referred to *Daudebardia*, otherwise exclusively a Palearctic genus. At the first glance the soft parts appear to confirm this determination. Closer scrutiny, however, strengthens the suspicion\* aroused by the supposed exceptional distribution.

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\*Kobelt (Jahrb. Deut. Mal. Gesell. vii. p. 26) and Fischer (Man. de Conch. p. 256) both catalogue this species as *Daudebardia (?) novoseelandica*.

Compared feature by feature with the European carnivores, radical structural differences are detected. Like *Thylacinus* and *Canis* or *Notoryctes* and *Chrysochloris*, this seems an instance where the same mode of life has moulded dissimilar organisms to the same external form. Having divorced *novoseelandica* from *Daudebardia*, a new genus is necessary for its reception, which may thus be provisionally outlined.

Family TESTACELLIDÆ.

SCHIZOGLOSSA, gen. nov.

Shell worn on the tail, incapable of containing the body, and reduced to the function of a shield to the lungs and heart, rudimentary, paucispiral, nacreous within, columella excavated into a pit for the reception of the shell-muscle. Animal lacking rachidian teeth.

Type and only known species *S. novoseelandica*, Pfeiffer.

*Schizoglossa* appears to me referable to that section of the *Testacellidæ* embracing its compatriots, *Rhytida*, *Elea* and *Paryphanta*, with which the lack of rachidian teeth and the simplicity of the genitalia allies it. Of these perhaps *Paryphanta* stands the closest.

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EXPLANATION OF PLATES.

PLATE IX.

- Fig. 1.—Spirit specimen of *Schizoglossa novoseelandica*, Pfr., seen from above. Magnified.
- Fig. 2.—Ditto, seen from the right side, showing respiratory orifice. Magnified.
- Fig. 3.—Posterior portion of shell of ditto, seen from beneath, showing muscle-scar and tubercles on the columella. Magnified.
- Fig. 4.—Genital system of ditto. Magnified.
- Fig. 5.—Tail of *Testacella haliotidea*, Draparnaud, copied from the "Histoire Naturelle des Mollusques terrestres et fluviatiles de France," Pl. v., fig. 9, to show position of respiratory orifice (*f*) for comparison with fig. 2.

## PLATE X.

- Fig. 6.—Alimentary canal of *S. novoseelandica*, showing, *a*, mouth; *b*, pharynx; *c*, retractor muscles of the latter; *d*, salivary glands; *f*, stomach; *h*, hepatic ducts; *g*, intestine. Magnified.
- Fig. 7.—Eviscerated cavity of body of ditto, showing foot-gland left undisturbed. Magnified.
- Fig. 8.—Egg of ditto. Magnified.
- Fig. 9.—Detail sketch of anterior portion of the genitalia of ditto, attached to a scrap of the body wall; on the left the right tentacle enters. Magnified.
- Fig. 10.—Diagram of visceral hump of ditto, shell and roof of lung removed, showing, *a*, heart; *b*, shell-muscle; *c*, kidney; *d*, position of anus; *e*, free visceral coil withdrawn from the initial shell whorl. Magnified.
- Fig. 11.—Inner half row of teeth from the radula of ditto. Much magnified.